

REMARKS

I. Introduction

Claims 28 to 42 are currently pending. Claims 28 to 30, 32 to 36, 40, and 42 have been amended. In view of the foregoing amendments and the following remarks, it is respectfully submitted that all of the presently pending claims are allowable, and reconsideration is respectfully requested.

II. Rejection of Claim 28 Under 35 U.S.C. § 102(e)

Claim 28 stands rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,088,788 ("Borkenhagen et al."). It is respectfully submitted that Borkenhagen et al. do not anticipate claim 28 for at least the following reasons.

Claim 28 has been amended herein without prejudice to include subject matter similar to that of claim 36 (which has been amended for clarity), and recites, *inter alia*, the following:

... at least one of the plurality of pipeline units is configured to: receive an instruction from another of the pipeline unit; issue the received instruction to a downstream pipeline unit; store a copy of the received instruction; and subsequent to the issuing of the received instruction, issue to the downstream pipeline unit the copy of the received instruction after a stall occurs in the one of the multiple threads.

With respect to the subject matter of claim 36 (similar subject matter of which is now incorporated in amended claim 28), the Examiner cites the combination of Borkenhagen et al. and U.S. Patent No. 5,907,702 ("Flynn et al.") as rendering claim 36 obvious under 35 U.S.C. § 103(a). Applicants respectfully submit that the combination of Borkenhagen et al. and Flynn et al. does not render amended claim 28 obvious, for at least the following reasons.

To reject a claim under 35 U.S.C. § 103(a), the Office bears the initial burden of presenting a *prima facie* case of obviousness. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 U.S.P.Q.2d 1955, 1956 (Fed. Cir. 1993). To establish *prima facie* obviousness, three criteria must be satisfied. First, there must be some suggestion or motivation to modify or combine reference teachings. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). This teaching or suggestion to make the claimed combination must be found in the prior art and not based on the application disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Second, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986). Third, the prior art reference(s) must

teach or suggest all of the claim features. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974).

In support of the obviousness rejection of claim 36, the Examiner asserts that Figure 2, queues 10 and 14 of Flynn et al. “disclose an instruction queue configured to pass issued instructions to a downstream pipeline unit . . . and store a copy of the issued instructions.” See Final Office Action, paragraph 26. However, the queues 10 and 14 store each received instruction and then pass on each of the *stored* instructions. Further, once the stored instruction is passed, it is not indicated in Flynn et al. that the passed stored instruction is maintained so that it can be passed again to a downstream unit. Even if the combination of Borkenhagen et al. and Flynn et al. suggest a queue that receives an instruction, stores a copy of the instruction, transmits the copy to the downstream unit, receives another copy of the previously received instruction, and repeats the storing and transmitting steps with respect to the second copy (which Applicants do not concede), the combination of Borkenhagen et al. and Flynn et al. still does not disclose or suggest the instruction queue of claim 36, and similarly does not disclose or suggest the “at least one of the plurality of pipeline units” of claim 28. For example, with respect to claim 28, the at least one of the plurality of pipeline units is configured to issue a received instruction to a downstream unit and store a copy of the received instruction. With respect to the same received instruction, the at least one pipeline unit is configured to issue to the downstream unit the copy of the received instruction after a stall occurs, aside from the initial issuance of the received instruction to the downstream unit. Nowhere to either of Borkenhagen et al. and Flynn et al. or their combination disclose or suggest these features.

Furthermore, amended claim 28 recites that the received instruction is issued to the downstream unit and (after a stall) the stored copy of the received instruction is issued to the downstream unit. The queues 10 and 14, however, transmit instructions in a single way, *i.e.*, they receive an instruction, store it in a queue, and transmit the queued instruction on to a downstream unit. They do not issue a received instruction and also a copy of the received instruction. For this additional reason, the combination of Borkenhagen et al. and Flynn et al. do not disclose or suggest the features recited in claim 28.

For at least the foregoing reasons, the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest all of the features recited in amended claim 28. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable claim 28.

Withdrawal of the rejection of claim 28 is therefore respectfully requested.

III. Rejection of Claims 29 to 36, and 38 to 42 Under 35 U.S.C. § 103(a)

Claims 29 to 36, and 38 to 42 were rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Borkenhagen et al. and Flynn et al. It is respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable any of claims 29 to 36, and 38 to 42 for at least the following reasons.

Claim 29 has been amended herein without prejudice to include subject matter similar to that of claim 36 (which has been amended for clarity), and recites, *inter alia*, the following:

... an instruction queue, wherein in a first operating mode, the instruction queue is configured to pass each of the series of instructions from the at least one upstream pipeline unit to the at least one downstream pipeline unit ... and configured to store a copy of each of the series of instructions, ... and in a second operating mode the instruction queue is configured to issue to the at least one downstream pipeline unit at least one of the copies on the one of the plurality of instruction threads on which a corresponding at least one of the series of instructions was previously issued.

As set forth above in support of the patentability of claim 28, the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest passing an instruction, storing a copy of the instruction that is passed, and then issuing the stored copy for which the corresponding instruction was passed. Instead, at most, it might be argued that the combination of Borkenhagen et al. and Flynn et al. refers to storing a copy of a first received instruction and a copy of a second received instruction that corresponds to the first received instruction, e.g., where two different copies of the same instruction are received from an upstream unit, and transmitting to a downstream unit each of the stored copies.

Accordingly, the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest all of the features recited in amended claim 29. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable claim 29.

Claim 32 has been amended herein without prejudice to include subject matter similar to that of claim 36 (which has been amended for clarity), and recites, *inter alia*, the following:

... storing a copy of each of the issued original instructions in a queue, and passing the issued original instructions to a downstream unit on the one of the plurality of instruction threads; ... and after detecting the stall, issuing at least one of the copies from the queue, on the one of the plurality of instruction threads on which the instructions were issued.

As set forth above in support of the patentability of claim 28, the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest these features. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable claim 32.

Claim 36, which has been amended herein for clarity, recites, *inter alia*, the following:

... an instruction queue configured to receive the instruction from the upstream pipeline unit, pass the received instruction to a downstream pipeline unit on the selected one of the plurality of threads, and store a copy of the received instruction, the instruction queue further configured to transmit, on the selected one of the plurality of threads, the copy of the received instruction in an event of a downstream stall on the selected one of the plurality of threads.

As set forth above in support of the patentability of claim 28, the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest these features. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable claim 36.

Claims 30 and 31 depend from claim 29 and therefore include all of the features recited in claim 29. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable these dependent claims for the same reasons set forth above in support of the patentability of claim 29. *In re Fine, supra* (any dependent claim that depends from a non-obvious independent claim is non-obvious).

Furthermore, with respect to claim 30, which recites “the instruction queue in the first operating mode is configured to alternate passing the series of instructions on the one of the plurality of instruction threads on which each of the series of instructions were issued when a stall signal is not present on any of the plurality of instruction threads,” the Examiner asserts that Flynn et al., column 1, lines 49-50 discloses switching of threads when a long-latency event occurs, alternating between active and dormant threads. *See* Final Office Action, paragraph 15. The cited section therefore refers to switching threads only when there is a stall and thus refers to the opposite of the subject matter of claim 30, *i.e.*, the opposite of alternating threads when a stall signal is not present.

Furthermore, with respect to claim 30, which recites a stall signal, while the section of Flynn et al. cited by the Examiner may refer to a long-latency event, it does not disclose or suggest a stall signal.

For these additional reasons, it is respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not disclose or suggest all of the features recited

in claim 30, so that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable claim 30.

Claims 33 to 35 depend from claim 32 and therefore include all of the features recited in claim 32. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable these dependent claims for the same reasons set forth above in support of the patentability of claim 32. *In re Fine, supra.*

Claims 38 to 42 depend from claim 36 and therefore include all of the features recited in claim 36. It is therefore respectfully submitted that the combination of Borkenhagen et al. and Flynn et al. does not render unpatentable these dependent claims for the same reasons set forth above in support of the patentability of claim 36. *Id.*

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

IV. Rejection of Claim 37 Under 35 U.S.C. § 103(a)

Claim 37 was rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Borkenhagen et al., Flynn et al., and U.S. Patent No. 5,381,533 ("Peleg et al."). It is respectfully submitted that the combination of Borkenhagen et al., Flynn et al., and Peleg et al. does not render unpatentable claim 37 for at least the following reasons.

Claim 37 depends from claim 36 and therefore includes all of the features recited in claim 36. Since Peleg et al. do not cure the deficiencies noted above with respect to the combination of Borkenhagen et al. and Flynn et al., it is therefore respectfully submitted that the combination of Borkenhagen et al., Flynn et al., and Peleg et al. does not render unpatentable this dependent claim for the same reasons set forth above in support of the patentability of claim 36. *Id.*

Withdrawal of this rejection is therefore respectfully requested.

V. Conclusion

In light of the foregoing, it is respectfully submitted that all of the presently pending claims are in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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